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DIPHTHERIA

DEPARTMENT OF HEALTH
COMMONWEALTH OF PENNSYLVANIA

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Diphtheria is a highly contagious and serious disease of the nose, throat or upper air passages. It easily can be prevented or cured. It is caused by the Klebs-Loeffler bacillus, a definite germ which produces this disease and no other. The presence of the germ causes an area of inflammation over which a tough grayish-white membrane spreads rapidly but the danger in diphtheria is not from the inflammation. The poison (called toxin) which the germs make and which goes all through the system of the patient weakens the heart, damages the kidneys and causes paralysis of various nerves and muscles.

There are three forms of diphtheria—namely, nasal, tonsillar and laryngeal. In nasal diphtheria only the nose may be involved. The tonsils are most commonly affected when the disease attacks the throat. The uvula or soft palate may also be involved· Removal of the tonsils in children does not prevent their contracting diphtheria. Diphtheria of the larynx is the most serious form on account of the danger of suffocation through obstruction of breathing by the membrane. Any one of these forms may occur singly or in combination with one or both of the others.

How It is Spread. Diphtheria is spread by infected persons. It is always induced by a more or less direct contact with a diphtheria patient or with one recently recovered from diphtheria. Diphtheria carriers also spread it. It is not carried in clothing. Occasional outbreaks are caused by infectious persons contaminating some food supply, such as milk.

Incubation. The incubation period is defined as the time necessary for the disease to develop after exposure. This is usually from two to three days but may vary greatly due to the virulence of the diphtheria bacillus or to the susceptibility of the person.

Symptoms. The disease usually begins with fever, sore throat and lack of appetite. Occassionally there is no complaint of sore throat. In nasal diphtheria a child may have snuffles accompanied by much discharge from the nose, frequently on one side only, sometimes containing little red streaks of blood· In laryngeal diphtheria a child may become hoarse with croup or refuse to talk. Every attack of croup should suggest the possibility of diphtheria. Any child's sudden illness demands an immediate inspection of the throat. When a child's indiposition is at all indicative of diphtheria a physician should be promptly called. Delay may sacrifice a life. Avoid home remedies.

Tonsillar diphtheria is the most common form of the malady. In this type the tonsils enlarge and become a darker red than when normal. A grayish-white membrane develops very rapidly.

Examination By Culture. Diphtheria bacilli have a definite appearance under the microscope and can readily be recognized. Since the diphtheria bacilli exist in the nose and the throat of infected persons, examination by culturing is practical. In making this examination, the physician or nurse swabs the tonsils and the nose with sterilized cotton. This is then placed in a sterile tube or smeared upon culture media and sent at once to the laboratory. This procedure is used to confirm the diagnosis and also is employed to determine when a person who is still carrying germs in his throat may be released from quarantine.

Diphtheria Carriers· A carrier of any disease is a person who is infected with its germs but who is not sick. After convalescence from diphtheria a small proportion of persons become carriers. A carrier can be identified only by means of throat cultures. When discovered he must be quarantined until further tests show that the nose and throat are free from germs. A carrier can remain such for a long time. Anything which comes in contact with the carrier's face or his mouth—for example, drinking cups or towels—usually becomes contaminated and can readily spread the disease if used shortly thereafter by others. A carrier can readily infect others by unprotected coughing or sneezing. When coughing or sneezing every one, sick or well, should use a handkerchief.

Antitoxin or toxin-antitoxin administered to immunize a person against diphtheria will not prevent his becoming a diphtheria carrier. Neither will they cure the carrier condition.

Care of the Patient. If a diphtheria patient cannot be sent to an isolation hospital he should be sequestered at home and confined in one room until well. The sick room should be kept clean and free from flies. No person, unless he is caring for the patient, should be admitted to the sick chamber, even though he has been immunized by antitoxin.

The patient must remain in bed until otherwise ordered by the attending physician. Antitoxin is the only efficacious treatment.

All discharges from the patient's nose and mouth, as well as all coughed up membrane, should be collected on gauze and burned immediately.

All personal and bed clothing when changed should at once be boiled. Blood-stained articles should first be soaked in cold water.

Antitoxin. Antitoxin is the only drug which will save life in diphtheria cases. It is this treatment that has reduced the large death rate from this disease in former years to the present low mark. Before the use of antitoxin diphtheria killed from thirty to forty percent. of all those contracting it. Today in Pennsylvania, with free antitoxin available for every one, the mortality is about ten percent. This could be considerably reduced if antitoxin were always administered without delay. The delay is usually caused by parents failing to realize that any sore throat may be diphtheria.

Antitoxin never produces paralysis or bad hearts. When these conditions develop in a diphtheritic person it is the direct result of the poisons (toxins) created by the diphtheria bacilli. It signifies that the antitoxin was given too late or the dose was not large enough to prevent the damage. Antitoxin can counteract toxin but it cannot restore vital tissue which toxins have already destroyed.

Antitoxin, to be most effective, must be given early and in large doses. A large single dose of antitoxin gives much better results than small doses in repeated injections.

Immunization. An attack of diphtheria does not necessarily make the person immune to future attacks; some persons have repeated attacks of diphtheria. Temporary immunity may be produced in well persons by giving a small dose of antitoxin. When diphtheria appears in a family it is advisable to give the well members, especially the children, immunizing doses of antitoxin, particularly if the sick person is not taken to an isolation hospital or the home is in a rural section where physicians cannot be quickly summoned. This antitoxin will prevent the others from contracting diphtheria. Protection from this dosage (one thousand units of antitoxin) usually is lost in from two to four weeks.

Schick Test. The Schick test determines if a person is susceptible to diphtheria. It is performed by injecting into the upper layers of the skin a minute drop of diphtheria toxin. The reaction which denotes susceptibility develops in from forty-eight to seventy-two hours and shows redness at the place where the toxin was injected, perhaps a small blister and some hardness of the skin. This result is termed a positive Schick and indicates that the person is susceptible to diphtheria. If no reaction develops the Schick test is negative and this denotes immunity.

Since practically all young children are susceptible to diphtheria the Schick test is recommended only for persons over six years of age. All children below the sixth year, and of course older ones giving a positive Schick, should be immunized to protect them from diphtheria attacks.

Toxin-Antitoxin. Those susceptible to diphtheria may be permanently immunized against it by injecting them with toxin-antitoxin, which is a mixture of diphtheria toxin and antitoxin. In using this preventive measure, three injections are made under the skin, with intervals of about one week between injections. It requires from three to four months after its administration for the body to develop immunity. For this reason, when diphtheria has appeared in a family the toxin-antitoxin treatment is of no use as a protection for the other members.

In a very small percentage of persons toxin-antitoxin fails to produce immunity. Every person who has had toxin-antitoxin should be Schick tested six months later to determine the result.

Quarantine. Every case of diphtheria, according to law, must be quarantined. Physicians are required to report diphtheria cases; institutional heads must notify the health authorities of the appearance of any diphtheria within their jurisdiction.

Every house containing a case of diphtheria must be placarded.

Quarantine must be maintained for a minimum of twenty-one days. In case of the removal or death of the patient, quarantine must continue for five days unless the members of the household have recently been immunized with antitoxin or have been found by the Schick test to be immune. In this latter case, the additional five days' quarantine is not required. Quarantine may be reduced to not less than fourteen days if all of the household are known to be immune and cultures of the patient's nose and throat fail to indicate the presence of bacilli, on two successive tests.

The premises used by the patient should receive a thorough cleaning after quarantine. Bedding, pillows and mattresses which cannot be washed should be placed out of doors in the sunshine for at least twelve hours.

Fumigation of a room used by a diphtheria patient is not required by the quarantine regulations. The patient or the carrier is infectious and to be guarded against—not the atmosphere or the furniture.